CHAPTER X: MORE STUDIES OF ACUPUNCTURE

Well, based on these kinds of studies, we can now go on and ask a series of specific studies that may allow us to go back and interrogate other facets of acupuncture that clinicians, practitioners I suspect have been scratching their heads about and maybe even to some extent arguing about over many years.

You know, one question is, "Does it matter how we perform acupuncture?" The studies that you've just seen were simple manual stimulation, but of course, there's a wide variety of acupuncture traditions which involve electrical stimulation. Some folks are even using optical stimulation. Does it make a difference?

Well, if we look at, say, two different acupuncture approaches, manual stimulation as I described before, and in this case hundred hertz electrical stimulation, both, as you would anticipate, will stimulate the primary somatosensory cortex in roughly equivalent ways and our data certainly suggests that's the case. Not surprising there.

What was for us somewhat gratifying to see in that it's supportive of this general hypothesis of the commonality of approaches across acupuncture traditions is that across manual acupuncture and electrical acupuncture, we also saw the same decrease in signal in these deep brain limbic structures and in associated cortical structures, independent of the means by which we delivered acupuncture.

Iris Chen, in her animal studies, actually also varied the form of the acupuncture. In this case, using two hertz electrical stimulation showed activity within these same deep brain structures; in this case, showed similar, but somewhat modulated changes when, in this case, the stimulation went from just a few minutes to a longer period of time, 20 minutes, more consistent with how clinical practice with acupuncture is typically performed, longer periods of stimulation, rather than very, very short ones; in this case, showing an increase in associated areas as if early modulations during short duration stimuli then have modulatory effects that may take several minutes in order to occur.

Interestingly, though, in this case, when she went to a different stimulus paradigm with higher energy, again began to see in this case increases in signal. Even in an anesthetized animal, there may be a correlate to so-called painful sensations. And so it does suggest that this point where the acupuncture can perform its inhibitory effects

perhaps may be a subtle one and it may to some extent account for why there's such a wide variety of effects that are reported in the literature which are dependent upon the acupuncturist and the specific way that they do it.

That borderline between *de qi* and a painful sensation is a difficult one to quantify biophysically and yet, it can make all the difference in terms of the underlying brain response. It gives us an important caveat as we think about designing clinical trails in terms of how we perform them and how we assess what's happening to our subjects during those trials.

Well, another question that certainly comes up all the time, especially when people are reviewing our papers and reviewing our grants, is, you know, what about acupoint specificity? Because in many settings, people are, and I think quite justifiably, unhappy using just a rest condition as a control and the first question somebody might ask is, "Well, why don't you use some other point?" And so the question is, "Do other points even make a difference?"

Indeed, in some of the earlier studies, Dr. Cho suggested that there may very well be brain specificity related to traditional acupuncture specificity. In these original studies of his, he actually suggested that it looked as though there was similar acupuncture activity within the primary visual areas when stimulating an area that was thought to be associated with visual cortex, suggesting a quite specific relationship between acupoint and underlying neurobiology.

But I'll have to say that most of our more recent data, including Dr. Cho's data, seems to suggest the opposite, that in fact, more of the effects seem to be much more generalized than they are -- across acupoints, than they are specific.

So for example, in the previous study that I showed you of those deep brain structures that were activated, that was the LI-4 in the wrist, stimulate Stomach 36 in the leg and you see deactivations again within those same cortical areas that we saw when we stimulated at the wrist. Very different [points], very different meridians, very different potential effects, in at least some traditional literatures, but similar underlying deep brain effects.

Here's just another example across three different regions that are performed by Randy Gollub, a slightly different format for displaying it, but again, quite a high degree

of correspondence in both activations and deactivations across multiple different stimuli regions.

Nevertheless, there do seem to be some differences between points. As I mentioned before, the traditional practitioners tell me that LI-4 is an especially sensitive and powerful area. Indeed, when you look at the brain as best as we can control, same acupuncturist, same needle, same techniques, the same overt external stimulation, we see a common pattern of activation across these two areas, liver 3, LI-4, but different degrees of modulation within this circuitry.

So again, practice counts, regions probably count, but perhaps not in a -- I've been told that it's really a naive, perhaps Western misconception of acupuncture practice, that specific points activate, you know, specific functions within the body or within the brain, the effects seem to be more generalized.